Docket No.: 1454.1610

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Elena COSTA et al.

Serial No. 10/532,346 Group Art Unit: 2617

Confirmation No. 3925

Filed: April 22, 2005 Examiner: Jaime Michele Holliday

For: METHOD FOR RADIO SYSTEM RESOURCE MANAGEMENT

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is in response to the Office Action mailed June 9, 2009, in the above-identified application, and pursuant to the Notice of Appeal filed September 9, 2009. Submitted herewith is an Appeal Brief. The due date for the filing of the Appeal Brief is one month from the mailing date of the Notice of Panel Decision from Pre-Appeal Brief Review, which is November 22, 2009. The due date of November 22, 2009 being a Sunday renders this appeal brief timely filed on Monday, November 23, 2009. The previously paid appeal fee set forth in 37 C.F.R.§ 41.20(b) should be applied.

I. REAL PARTY IN INTEREST

The real party in interest is SIEMENS AKTIENGESELLSCHAFT, Munich, the assignee of this application (per assignment submitted on April 22, 2005).

II. RELATED APPEALS AND INTERFERENCES

Appellants, appellants' legal representative, and the assignee do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by, or have a bearing on, the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-14 are cancelled.

Claims 15, 16, 18-20 and 26-28 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,052,593 to Guimont et al. (hereinafter "Guimont") in view of U.S. Publication No. 2004/001429 A1 to Ma et al. ("Ma").

Claim 17 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Guimont in view of Ma, and in further view of U.S. Patent No. 6,917,580 B2 to Wang et al. ("Wang"). Claims 21 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Guimont in view of Ma and in further view of U.S. Publication No. 2002/0147017 to Li et al. ("Li"). Claim 23 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the combination of Guimont and Ma in view of Li, and in further view of U.S. Patent No. 5,726,978 to Frodigh et al. ("Frodigh"). Claims 24 and 25 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the combination of Guimont and Ma, in view of Li and Frodigh, and further in view of U.S. Publication No. 2002/0082016 A1 to Obayashi. ("Obayashi").

Rejection of claims 15-28 is appealed.

IV. STATUS OF AMENDMENTS

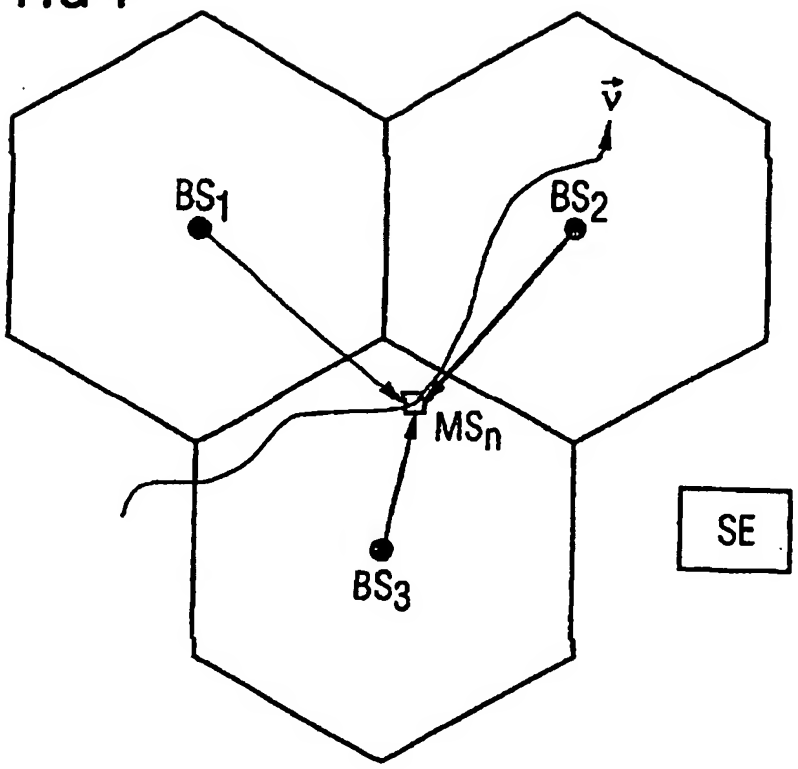
No amendment was entered after the Office Action of June 9, 2009. A Pre-Appeal Brief Conference Request was filed with the Notice of Appeal on September 9, 2009. The pre-Appeal Brief Panel decided that the appeal should proceed.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Introduction

A radio communication system (see FIG. 1 of the application reproduced below) includes subscriber stations (e.g. mobile station MS_n), base stations (e.g. nodes BS_1-BS_3) and other network devices. Generally, a mobile station is connected to one base station as long as the mobile station is located inside a radio cell (illustrated as a hexagonal shape in FIG. 1 of the application), which surrounds the base station. The frequency band available for the electromagnetic communication in the radio communication system is usually divided into sub-carriers. Management of time slots and/or frequency sub-carriers in the radio communication system is critical to achieving a reduction of interference of signals emitted from different base stations at the mobile station and for efficient handovers (i.e., passage of the mobile station from one base station to another).

FIG 1



a. Claim 15

Independent claim 15 is directed to a method for managing radio resources of a frequency band having sub-carriers in a cellular radio communications system configured as a multi-carrier system (see e.g. FIG. 1 above and FIG. 2 of the application, described on pages 7 and 8 paragraphs [0028] to [0031]). The method of claim 15 includes temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cell for transmission of information (see paragraph [0013]).

The method of claim 15 further includes allocating the sub-carriers to the radio cells during a second time period, the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information (see paragraphs [0014] and [0016]).

b. Claim 27

Independent claim 27 is directed to a radio communication system of cellular construction configured as a multi-carrier system using at least one frequency band having sub-carriers for transmission of information (see FIG. 1 described in paragraph [0028] on page 7).

The radio communication system includes at least two radio cells (e.g., the hexagonal shapes around BS_1, BS_2, BS_3 in FIG. 1) and at least one control device (e.g., SE in FIG. 1) assigning the sub-carriers of the at least one frequency band to said at least two radio cells (see paragraph [0029]). The control device makes all of the sub-carriers temporarily available to each radio cell for transmission of information, during a first time period, and then makes each of the sub-carriers available to a subset of the at least two radio cells for transmission of information, during a second time period (see paragraphs [0030], [0033]-[0035] and [0037]).

c. Claim 28

Independent claim 28 is directed to a control device (SE in FIG. 1) of a radio communication system of cellular construction, that is configured as a multi-carrier system having at least two radio cells with at least one frequency band having sub-carriers for transmission of information in the at least two radio cells (see FIG. 1 and paragraph [0029]). The control device SE has means for temporarily assigning the sub-carriers of the at least one frequency band to the at least two radio cells during a first time period so that the sub-carriers are temporarily available to each radio cell for the transmission of the information, and means for temporarily assigning the sub-carriers of the at least one frequency band among the at least two radio cells during a second time period so that each of the sub-carriers is temporarily available to a subset of the at least two radio cells for the transmission of the information (see paragraphs [0030], [0033]-[0035] and [0037]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants request review of rejection of claims 15, 16, 18-20 and 26-28 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,052,593 to Guimont et al. in view of U.S. Publication No. 2004/001429 A1 to Ma et al.

VII ARGUMENT

a. Review of the Prior Art

Guimont discloses a method for assigning frequencies to transceivers in cells of a cellular telephone system supporting analog and/or digital communications channels (see col. 1, lines 10-13 of Guimont). A frequency assignment proposal is evaluated to determine whether it is compatible with a current cell configuration, by insuring that sufficient frequencies are available for assignment to meet the traffic and control channel requirements and availability of the included cell transceivers. (See Guimont's Abstract.) Approved proposals result in a revision of

the frequency plan assignment. Based on records of past approved proposals, it is determined whether a current proposal if implemented would have an adverse effect on the network.

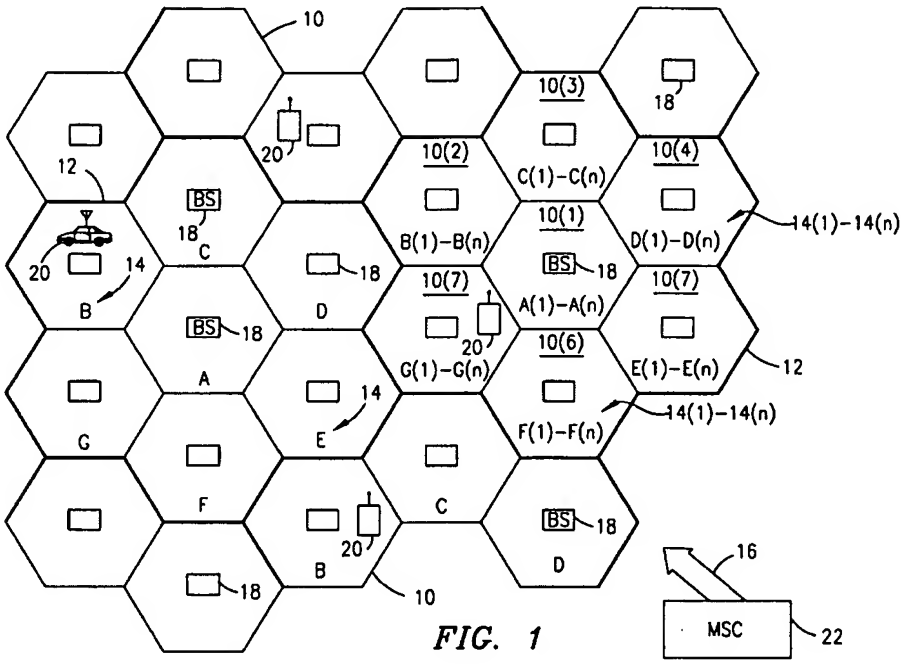


FIG. 1

FIG. 1 of Guimont (reproduced above) illustrates the cells 10 being grouped in clusters of cells 12. Each cluster 12 uses all the available frequencies (subsets A to G) while any single cell 10 of a cluster uses only a subset (e.g. subset A) of the available frequencies. (See col. 4, lines 7-40.) Thus, within the cluster the base station do not interfere because they use different frequencies. This model does not foresee handover of mobile station moving from one cell to a neighboring one.

Although in Guimont the allocation of the frequencies may be changed, such a change occurs only when an alternative allocation is judged to be beneficial. However, the allocation can be maintained indefinitely. A change of the allocation of the frequencies is not a known predetermined event occurring after or at known moments. Thus, no allocation of the frequencies is temporary, to be changed after a first time period, according to a predetermined sequence of allocation schedules.

Ma discloses a wireless terminal for communicating over a shared Orthogonal Frequency Division Modulation (OFDM) band. Ma is directed to uplink communication of multiple user with one base station (see e.g. paragraph [0110] in the context set forth in [0002] and [0003]).

Ma's wireless terminal has a first transmit chain for generating and transmitting a low rate mode OFDM transmission in a first frequency band of the OFDM band, and a second transmit

chain for generating and transmitting a burst-mode transmission in a second frequency band of the OFDM band, the first frequency band being distinct from the second frequency band.

Figure 2 of Ma (reproduced below) illustrates the usage of OFDM frequencies 1-32. Each circle represents a single sub-carrier during a single transmission (see [0122]). Mode 1 sub-carriers are used for low rate circuit oriented connectivity, while Mode 2 sub-carriers used for higher rate bursting connectivity. At certain times, e.g. between t_{i+10} and t_{i+11}, all the carriers may be used for Mode 1. Paragraph [0219] states:

> [0219] In some embodiments, the RACH is also used for initial timing and synchronization. After randomly selecting one of the RACH signatures, an accessing UE transmits using the whole available access band--this preferably includes all Mode-1 sub-carriers.

However, this refers to a user equipment (mobile phone), not all cells. That is all subcarriers are available relative to the same single base station receiving the data from multiple users (i.e. terminals). Given the typical fixed position of the base station, Ma merely discusses usage of the frequency band for communication within a cell as defined in the context of the invention.

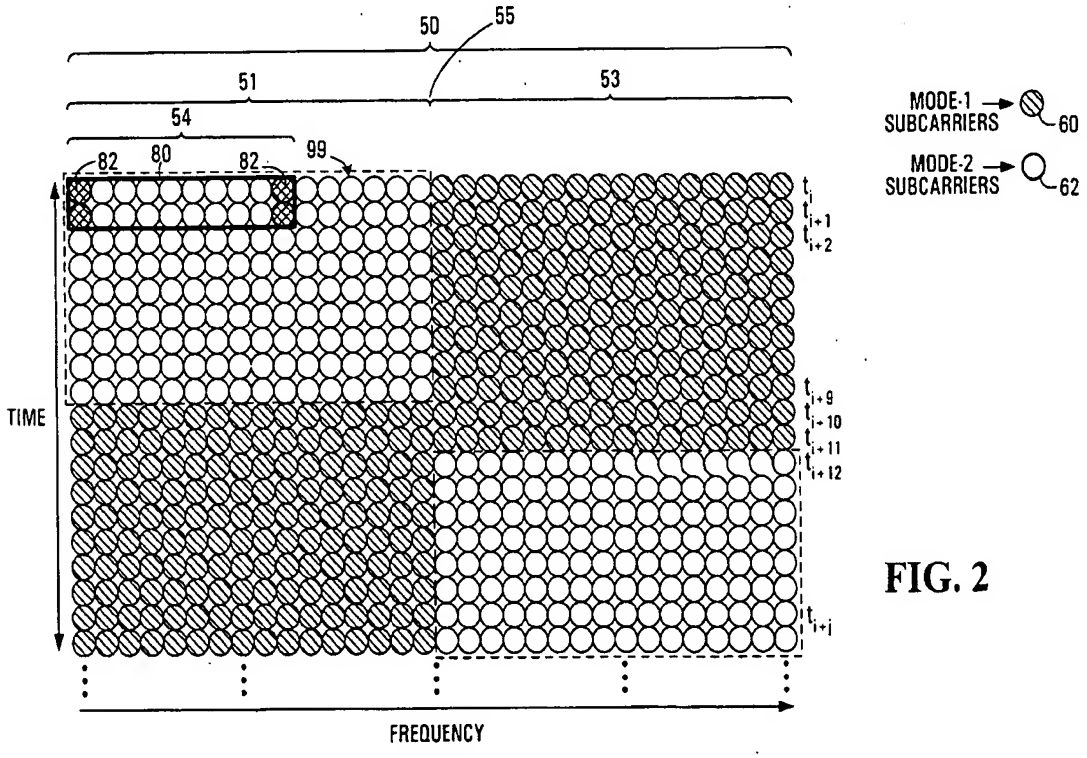


FIG. 2

b. Ma and Guimont do not render obvious "temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cells for transmission of

information" and "allocating the sub-carriers to the radio cells during a second time period, the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information"

Guimont and Ma do not render obvious "temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cells for transmission of information" and "allocating the sub-carriers to the radio cells during a second time period, the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information."

Guimont's and Ma's teachings would lead a person of ordinary skill in the art to a method having the following features: (1) dividing the radio frequencies in the cellular frequency band according to a frequency band into frequency groups, (2) grouping cells into clusters, (3) assigning a different frequency group to each cluster, and (4) allocating frequency groups (sub-carriers) to different transmission modes during different time periods within a cell.

That is, even if Guimont generally discloses allocating subcarriers to radio cells, it does not anticipate or render obvious at least making the sub-carriers available temporarily during a first time period to each radio cell for transmission of information in claim 15. A person of ordinary skill in the art would understand that "temporarily during a first time period" teaches a planned limited time interval and not a random state as in Ma. The first allocation lasting only a first (limited, known) time according to a predefined time pattern is conveyed to a person of ordinary skill in the art by the recitation "temporarily during a first time period."

In contrast, in Guimont, change in the allocation of the subcarriers is not a required step.

Further, even if Ma discloses an allocation of sub-carriers to modes in different time-frames, Ma does **not** disclose or render obvious allocating the sub-carriers to the radio cells as recited in claim 15. That is, Ma's allocation of sub-carriers may be performed to manage frequency resources in a single base station or radio cell (e.g., BS_1 in FIG. 1 of the application). Moreover Ma refers to uplink not to downlink. Thus, if Guimont may be considered to disclose a method of spatial allocation of sub-carriers, and Ma with a time allocation of subcarriers within a cell, none of Guimont and Ma teaches a method in which the time and the spatial aspect of frequency allocation in radio cells (which as defined in the application have different fixed base stations) are convoluted.

For a graphical illustration of the argument, knowledge of the X axis (i.e. spatial allocation on Guimont) and knowledge of the Y axis (i.e. temporal allocation in one base station in Ma) do not render obvious a shape on the two-dimensional space XY as in the case of the claimed method. Moreover, the two-dimensional shape illustrating the claimed method is selected to achieve specific advantages, as described in the application. This graphical illustration does not even take into consideration a z dimension, the sub-carriers.

The advantages achieved by the claimed method are not possible with the method resulting merely from combining Guimont and Ma which would result in a method as outlined above. The claimed method provides the information necessary for handover decisions and serves as a basis for reducing interference and enabling a higher spectrum efficiency (see paragraphs [0036]-[0039] on pages 9-10 of the specification).

c. The combination of Guimont and Ma is a hindsight reconstruction of the claimed invention

The teachings of the references are combined based on the following basis (see page 8, lines 17-20 of the outstanding Office Action):

> Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to assign different sub-carriers to modes that are implemented at different periods as taught by Ma et al. in the method of Guimont et al., in order to efficiently create a frequency plan.

"Efficiently creating a frequency plan" is the objective in Guimont and it is not related or achieves the advantages of the claimed method. Appellants respectfully submit that "efficiently creating a frequency plan" is not a valid reason to combine Guimont's and Ma's teachings.

In *KSR Corp. v. Teleflex Inc.* (2007), the Supreme Court maintained that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it was "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed.[1]

In the response to arguments section of the outstanding Office Action, the Examiner challenges the legal basis of Applicant's arguments stating that

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[1] Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. KSR, slip op. at 14.

(1) "one cannot show non-obviousness by attacking references individually where the rejections are based on combination of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)" (see Page 2, lines 9-12 in the "Response to Arguments" section); and

(2) "it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971)" (see page 5, lines 5-11 in the "Response to Arguments" section).

In response to (1), Applicant respectfully submit that Applicant's arguments did not argue the references individually, but argued that none of the references disclose the features recited in the claims and combining Guimont's and Ma's teachings is baseless and do not yield the claimed features.

In particular, Ma discloses an allocation of sub-carriers to modes in different time-frames which can be performed in a single radio cell, but Ma does **not** disclose or render obvious allocating the sub-carriers to a plurality of spatial distributed radio cells in different time-frames as recited in claim 15.

Additionally, as stated in MPEP 2143.03, all claim limitations must be considered. "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Moreover, as stated in MPEP 2141.02, the differences between the prior art and the claims at issue requires interpreting the claim language, and considering both the invention and the prior art references as a whole.

In this case, none of Guimont or Ma teaches, for example, "temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cells for transmission of information." The Examiner argues that Guimont teaches "allocating the sub-carriers to the radio cells" and that Ma teaches "temporarily during a first time period allocating the sub-carriers." However, neither Guimont nor Ma disclose or render obvious "temporarily during a first time period allocating the sub-carriers to the radio cells." Therefore, Appellants argue above that neither Guimont nor Ma disclose or render obvious the claimed feature as a whole as required based on MPEP 2143.03 and MPEP 2141.02. Additionally, neither Guimont nor Ma nor their combination disclose or render obvious

"[making] the sub-carriers available during a first time period to each radio cells for transmission of information" as recited in the second part of the above-reproduced feature.

The above graphical illustration of Guimont's and Ma's teachings versus the claimed invention may be appropriately recalled after the above-argument.

Regarding (2), all the authority cited by the Examiner is superseded by the Supreme Court decision U.S. Supreme Court decision *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395-97 (2007). According to this decision the key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious (see also MPEP 2143). The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. should be made **explicit**. A number of admissible rationales are put forth in the decision none of which being hindsight reconstruction.

In this case, the Examiner has not met the burden of explicitly showing a reason for combining the features of the applied prior art references. An objective (to "efficiently create a frequency plan") already achieved (in Ma) and relevant only in a different context (i.e. a single base station or radio cell in Ma) does not provide a valid reason for combining Guimont's and Ma's teachings.

VIII. CONCLUSION

Applicants submit that claims 15-28 patentably distinguish over the prior art. Reversal of the Examiner's rejections is respectfully requested

Respectfully submitted,

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Date: Nov. 23, 2009

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IX. THE CLAIM APPENDIX

1-14. (CANCELLED).

15. (PREVIOUSLY PRESENTED) A method for managing radio resources of a frequency band having sub-carriers in a cellular radio communications system configured as a multi-carrier system, comprising:

temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cells for transmission of information; and

allocating the sub-carriers to the radio cells during a second time period, the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information.

16. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said allocating of the sub-carriers during the second time period makes at least one of the sub-carriers available to exactly one radio cell in the at least two radio cells.

17. (PREVIOUSLY PRESENTED) A method in accordance with claim 16, wherein said allocating of the sub-carriers during the second time period makes each of the sub-carriers available to exactly one radio cell in the at least two radio cells.

18. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein the at least two radio cells are adjacent radio cells.

19. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said allocating of the sub-carriers during the second time period allocates the sub-carriers to n radio cells, making assigned sub-carriers available to at least one radio cell have a frequency spacing of n sub-carriers.

20. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said allocating of the sub-carriers during the second time period makes at least some adjacent sub-carriers in the frequency band available to at least one radio cell.

21. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said

allocating of the sub-carriers during the second time period takes place in accordance with an algorithm that includes use of a code.

22. (PREVIOUSLY PRESENTED) A method in accordance with claim 21, wherein said allocating of the sub-carriers during the second time period makes the sub-carriers used by base stations of particular radio cells available for transmission of broadcast information.

23. (PREVIOUSLY PRESENTED) A method in accordance with claim 22, wherein the broadcast information is used to decide on handovers.

24. (PREVIOUSLY PRESENTED) A method in accordance with claim 23, further comprising determining amplitudes of the broadcast information in subscriber stations receiving the broadcast information.

25. (PREVIOUSLY PRESENTED) A method in accordance with claim 24, further comprising determining a metric of the amplitudes of the broadcast information transmitted from one of the base stations on the sub-carriers available to the one of the base stations.

26. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein the cellular radio communications system is an orthogonal frequency division multiplexing system.

27. (PREVIOUSLY PRESENTED) A radio communication system of cellular construction configured as a multi-carrier system using at least one frequency band having sub-carriers for transmission of information, comprising:

at least two radio cells; and

at least one control device assigning the sub-carriers of the at least one frequency band to said at least two radio cells during a first time period to make all of the sub-carriers temporarily available to each radio cell for transmission of information, and that during a second time period temporarily each of the sub-carriers is available to a subset of the at least two radio cells for transmission of information.

28. (PREVIOUSLY PRESENTED) A control device of a radio communication system of cellular construction, that is configured as a multi-carrier system having at least two radio cells with at least one frequency band having sub-carriers for transmission of information in the at

least two radio cells, comprising:

means for temporarily assigning the sub-carriers of the at least one frequency band to the at least two radio cells during a first time period so that the sub-carriers are temporarily available to each radio cell for the transmission of the information; and

means for temporarily assigning the sub-carriers of the at least one frequency band among the at least two radio cells during a second time period so that each of the sub-carriers is temporarily available to a subset of the at least two radio cells for the transmission of the information.

X. EVIDENCE APPENDIX

Not applicable.

XI. RELATED PROCEEDING APPENDIX

Not applicable.